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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/587,940	09/29/2006	Ya Xu	2006-1228A	6659

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EXAMINER	
VAN OUDENAREN, SARAH A	
ART UNIT	PAPER NUMBER
1793	

NOTIFICATION DATE	DELIVERY MODE
05/27/2010	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/587,940	XU ET AL.	
	Examiner	Art Unit	
	SARAH VAN OUDENAREN	1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 April 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *2,6,9,21,23 and 26-29* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *2, 6, 9, 21, 23, 26-29* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 21 and 2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shaw et al (US 5,330,701) in view of Takuya et al (JP 02-141402) and further modified by Lessing (US 5.496,655).

Shaw teaches an intermetallic powder which is Ni_3Al (col 2, lines 30-35 and col 4 lines 30-40).

Shaw does not teach producing hydrogen.

Takuya teaches a Ni containing metal being deposited on a member into which Al is incorporated to form a catalyst on the surface. Methanol or a mixture of methanol and water is supplied to the catalytic surface and a hydrogen containing gas is produced form the mixture. Takuya teaches this method increases the reforming reaction rate for methanol (see abstract).

Lessing teaches a Ni_3Al intermetallic materials being catalytic in character and used in steam reforming of hydrocarbon fuels, i.e. methane, into hydrogen (col 5, lines 47-55).

It would have been obvious to one of ordinary skill in the art at the time of the invention to utilize the method of producing hydrogen of Takuya with the compound of

Shaw in order to increase the reforming reaction rate for methanol and further, as Lessing teaches the Ni_3Al intermetallic material being used as a catalyst for methane reformation, it would have been obvious to one of ordinary skill in the art at the time of the invention to utilize a similar material for a similar purpose.

Regarding claim 2, Shaw teaches 86.7 wt% Ni and 13.3 wt% Al (col 7, lines 45-50). Further, Shaw teaches that for Ni_3Al the Ni may be present in an amount of 84.0-88.0 wt% (col 9, lines 45-50). The balance would inherently be 12.0-16.0 wt% Al.

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shaw et al (US 5,330,701) as modified by Takuya et al (JP 02-141402) and by Lessing (US 5.496,655) as applied to claim 21 above and further in view of Fukui et al (US 5,635,439).

Shaw teaches an intermetallic Ni_3Al compound as discussed above.

Shaw does not teach producing hydrogen.

It would have been obvious to one of ordinary skill in the art at the time of the invention to utilize the method of producing hydrogen of Takuya with the compound of Shaw in order to increase the reforming reaction rate for methanol and further, as Lessing teaches the Ni_3Al intermetallic material being used as a catalyst for methane reformation, it would have been obvious to one of ordinary skill in the art at the time of the invention to utilize a similar material for a similar purpose.

Neither Shaw nor Takuya teach reducing the catalyst in a hydrogen atmosphere.

Fukui teaches a catalyst for methanol reformation which is heated in an air stream containing hydrogen to reduce the catalyst in order to impart catalytic activity to the catalyst (col 1, lines 45-55).

It would have been obvious to one of ordinary skill in the art at the time of the invention to utilize the reduction of Fukui with the compound of Shaw as modified by Takuya in order to impart catalytic activity upon the compound.

Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shaw et al (US 5,330,701) as modified by Takuya et al (JP 02-141402) and by Lessing (US 5.496,655) as applied to claim 21 above and further in view of Makoto et al (JP 63-209753).

Shaw teaches an intermetallic Ni_3Al compound as discussed above.

Shaw does not teach producing hydrogen.

It would have been obvious to one of ordinary skill in the art at the time of the invention to utilize the method of producing hydrogen of Takuya with the compound of Shaw in order to increase the reforming reaction rate for methanol and further, as Lessing teaches the Ni_3Al intermetallic material being used as a catalyst for methane reformation, it would have been obvious to one of ordinary skill in the art at the time of the invention to utilize a similar material for a similar purpose.

Neither Shaw nor Takuya teach reducing the catalyst being acid or alkali treated.

Makoto teaches a catalyst for methanol reforming where Cu, Ni and Al are to be used. The compound is alkali treated to obtain precipitates (see abstract).

It would have been obvious to one of ordinary skill in the art at the time of the invention to utilize the alkali treatment of Makoto with the compound of Shaw in order to obtain precipitates, and further, as Lessing teaches the Ni_3Al intermetallic material being used as a catalyst for methane reformation, it would have been obvious to one of ordinary skill in the art at the time of the invention to utilize a similar material for a similar purpose.

Claims 23, 6, and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shaw et al (US 5,330,701) as modified by Lashmore et al (US PG Pub 2008/0014431) and by Coll et al (US PG Pub 2003/0042226) and further in view of Takuya et al (JP 02-141402).

Shaw teaches an intermetallic Ni_3Al compound as discussed above.

Shaw does not teach carbon nanofibers containing fine metal particles deposited on the surface of the compound.

It would have been obvious to one of ordinary skill in the art at the time of the invention to include the Ni_3Al intermetallic compound of Shaw with the carbon nanofibers of Lashmore as Coll teaches it is known to grow carbon nanotubes on a NiAl catalyst and further because the carbon nanofibers of Lashmore are synthesized on the surface of the catalytic particles which are taught as Ni or alloys of Ni and that the nanofibers may also contain catalytic particles as discussed above.

Neither Shaw nor Lashmore teaches the production of hydrogen.

Takuya teaches a Ni containing metal being deposited on a member into which Al is incorporated to form a catalyst on the surface. Methanol or a mixture of methanol and water is supplied to the catalytic surface and a hydrogen containing gas is produced form the mixture. Takuya teaches this method increases the reforming reaction rate for methanol (see abstract).

It would have been obvious to one of ordinary skill in the art at the time of the invention to utilize the method of producing hydrogen of Takuya with the compound of Shaw as modified by Lashmore in order to increase the reforming reaction rate for methanol.

Regarding claim 6, Lashmore teaches that the carbon nanotube fibers may contain catalyst particles (page 1, paragraph 4, lines 8-13) and that the catalyst particles are Ni or its alloys. It would have been obvious to one of ordinary skill in the art at the time of the invention to include the particles of Lashmore with the Ni_3Al intermetallic compound of Shaw in order to aid in increased catalytic performance.

Regarding claim 26, Shaw teaches 86.7 wt% Ni and 13.3 wt% Al (col 7, lines 45-50). Further, Shaw teaches that for Ni_3Al the Ni may be present in an amount of 84.0-88.0 wt% (col 9, lines 45-50). The balance would inherently be 12.0-16.0 wt% Al.

Claim 27 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shaw et al (US 5,330,701) as modified by Lashmore et al (US PG Pub 2008/0014431) and by Coll et al (US PG Pub 2003/0042226) and further in view of Takuya et al (JP 02-141402) as applied to claim 23 above and further modified by Fukui et al (US 5,635,439).

Shaw teaches an intermetallic Ni_3Al compound as discussed above.

Shaw does not teach carbon nanofibers containing fine metal particles deposited on the surface of the compound.

It would have been obvious to one of ordinary skill in the art at the time of the invention to include the Ni_3Al intermetallic compound of Shaw with the carbon nanofibers of Lashmore as Coll teaches it is known to grow carbon nanotubes on a NiAl catalyst and further because the carbon nanofibers of Lashmore are synthesized on the surface of the catalytic particles which are taught as Ni or alloys of Ni and that the nanofibers may also contain catalytic particles as discussed above.

Neither Shaw nor Lashmore teaches reducing the catalyst in a hydrogen atmosphere.

Fukui teaches a catalyst for methanol reformation which is heated in an air stream containing hydrogen to reduce the catalyst in order to impart catalytic activity to the catalyst (col 1, lines 45-55).

It would have been obvious to one of ordinary skill in the art at the time of the invention to utilize the reduction of Fukui with the compound of Shaw as modified by Lashmore in order to impart catalytic activity upon the compound.

Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Shaw et al (US 5,330,701) as modified by Lashmore et al (US PG Pub 2008/0014431) and by Coll et al (US PG Pub 2003/0042226) and further in view of Takuya et al (JP 02-141402) as applied to claim 23 above and further modified by Makoto et al (JP 63-209753).

Shaw teaches an intermetallic Ni_3Al compound as discussed above.

Shaw does not teach producing hydrogen.

It would have been obvious to one of ordinary skill in the art at the time of the invention to utilize the method of producing hydrogen of Takuya with the compound of Shaw in order to increase the reforming reaction rate for methanol and further, as Lessing teaches the Ni_3Al intermetallic material being used as a catalyst for methane reformation, it would have been obvious to one of ordinary skill in the art at the time of the invention to utilize a similar material for a similar purpose.

Neither Shaw nor Takuya teach reducing the catalyst being acid or alkali treated.

Makoto teaches a catalyst for methanol reforming where Cu, Ni and Al are to be used. The compound is alkali treated to obtain precipitates (see abstract).

It would have been obvious to one of ordinary skill in the art at the time of the invention to utilize the alkali treatment of Makoto with the compound of Shaw in order to obtain precipitates, and further, as Lessing teaches the Ni_3Al intermetallic material being used as a catalyst for methane reformation, it would have been obvious to one of ordinary skill in the art at the time of the invention to utilize a similar material for a similar purpose.

Response to Arguments

Applicant's arguments filed 2/5/2010 have been fully considered but they are not persuasive. Currently, the pending claims are 2, 6, 9, 21, 23, 26-29.

Applicant argues that both Shaw and Takuya do not teach Ni_3Al being used as a catalyst. Examiner agrees and notes that these references are not relied upon for such a teaching. Takuya teaches a Ni-containing metal is deposited on an Al-containing metallic member to form a methanol steam reforming catalyst as discussed above. Shaw teaches an intermetallic Ni_3Al compound as discussed above. Lessing teaches that Ni_3Al can catalyze steam reforming of hydrocarbons, as discussed above. Lessing is utilized by examiner to evidence the catalytic properties of Ni_3Al. Applicant argues that there is no example or evidence of such catalytic properties of NiAl or Ni_3Al within Lessing. Examiner maintains that Lessing's teaching of NiAl and Ni_3Al being utilized to catalyze steam reforming of hydrocarbons is an explicit teaching of catalytic properties of NiAl and Ni_3Al. The rejection is maintained.

Applicant argues that one of ordinary skill in the art would have been led away from utilizing Ni_3Al in a methanol reforming reaction as a high activity for Ni_3Al in this reaction is seemingly unexpected as shown by the art submitted by applicant in the response filed 2/5/2010. While examiner has fully examined the submitted references, examiner disagrees with the argument. Examiner is not attempting to argue that the catalyst of the rejection above has the same high activity that the instant catalyst has obtained, however examiner maintains that the art above clearly discusses and teaches Ni_3Al being known to have catalytic activity. If applicant is attempting to argue unexpected results, further evidence or explanation will need to be submitted. Further, a limitation of high catalytic activity is not required in the instant claim language.

Applicant argues over the remaining rejections similarly as has been discussed above.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SARAH VAN OUDENAREN whose telephone number is (571)270-5838. The examiner can normally be reached on Monday-Thursday, 9:00-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Melvin Curtis Mayes can be reached on 571-272-1234. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/SARAH VAN OUDENAREN/
Examiner, Art Unit 1793
May 21, 2010

/Melvin Curtis Mayes/
Supervisory Patent Examiner, Art Unit 1793